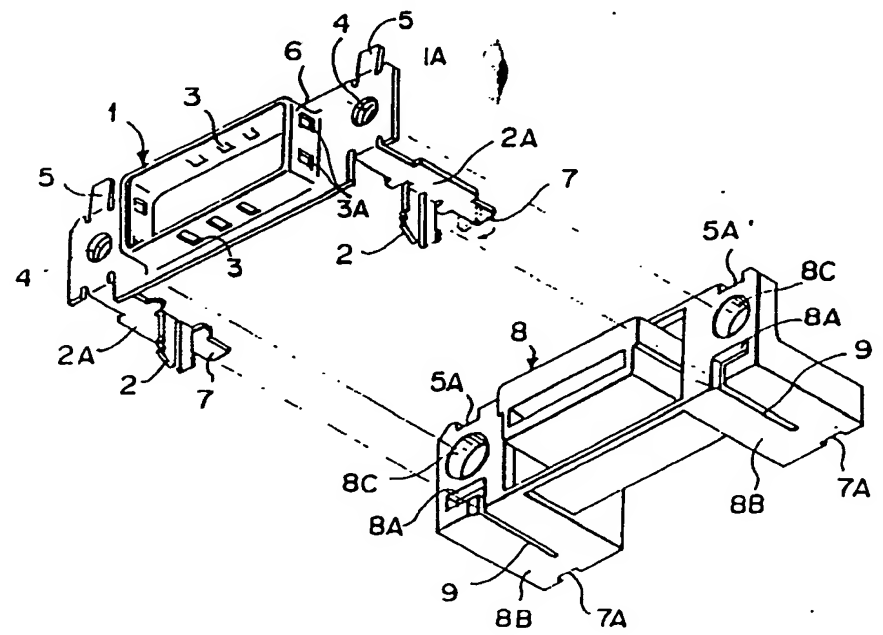




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification⁴ : H01R 13/658</p>	<p>A1</p>	<p>(11) International Publication Number: WO 88/ 08627 (43) International Publication Date: 3 November 1988 (03.11.88)</p>
<p>(21) International Application Number: PCT/US88/00940 (22) International Filing Date: 25 March 1988 (25.03.88) (31) Priority Application Number: 62/66243 (32) Priority Date: 30 April 1987 (30.04.87) (33) Priority Country: JP (71) Applicant (for all designated States except US): AMP INCORPORATED [US/US]; P.O. Box 3608, 470 Friendship Road, Harrisburg, PA 17105 (US). (72) Inventor; and (75) Inventor/Applicant (for US only) : FUJIURA, Yoshitsugu [JP/JP]; 3-12-9, Kohyama, Nerima-ku, Tokyo (JP). (74) Agents: SEITCHIK, Jay, L. et al.; AMP Incorporated, P.O. Box 3608, 470 Friendship Road, Harrisburg, PA 17105 (US).</p>		<p>(81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), IT (European patent), KR, LU (European patent), NL (European patent), SE (European patent), US. Published With international search report.</p>
<p>(54) Title: ELECTRICAL CONNECTOR SHIELDED MEMBER HAVING MOUNTING MEANS</p>  <p>(57) Abstract</p> <p>A shield member (1) for mounting onto an electrical connector comprises a shield section (1A) secured onto a dielectric housing (8) with integral leg sections (2A) of the shield section (1A) being disposed in slots (8A) of the housing (8) and mounting members (2) integral with the leg sections (2A) extending through slots (9) in housing (8) and outwardly from a bottom surface of housing (8) for engagement with holes in a circuit board.</p>		

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ELECTRICAL CONNECTOR SHIELDED MEMBER HAVING MOUNTING MEANS

The present invention is related to an electrical connector and particularly to an electrical connector shield member for mounting onto an electrical connector
5 and having mounting means for mounting an electrical connector to a circuit board.

US-A- 4,679,883 discloses a right angle connector having a metal shield surrounding the mating face. Ground straps integral with the metal shield extend to respective
10 mounting faces. An eyelet passes through apertures in a flange and through the ground strap to secure the connector to a printed circuit board and simultaneously provide an electrical path from the metal shield to a
15 ground on the printed circuit board. Thus, for an electrical connector to be mounted on a circuit board and requiring electromagnetic shielding, the connector included a shield member for shielding the connector and separate mounting members for mounting the shielded
connector to a circuit board.

20 Accordingly, a problem arose in that a large number of man-hours was needed for manufacturing and assembly of such a connector. Furthermore, the ground connection between the shield member and the circuit board was not reliable.

25 The purpose of this invention is to provide a shield member having excellent electrical characteristics, and which is easily assembled by manufacturing the shield member and the mounting members integrally as one member thereby avoiding the possibility of an incomplete
30 electrical connection between two separate parts. Further, the man-hours required for the assembly can be reduced since the integrally-formed shield member with mounting members is easily fitted to the connector housing and secured thereon. The resulting electrical connector
35 assembly can be readily mounted onto a circuit board.

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In accordance with the present invention, a shield member comprises a shield section covering a front surface of a connector housing and mounting members for mounting an electrical connector onto and to a circuit board. The invention is characterized in that the shield member and mounting members are integrally formed from a sheet of suitable conductive metal, and, on the shield section and at the end of the mounting members, securing sections are provided for securing the shield member to the connector housing.

Accordingly, a shield member can be made by which the possibility of an incomplete connection between the shield member and the mounting members is avoided, the man-hours required for assembly of the shield member onto a connector housing and for mounting the connector onto a circuit board are reduced. Furthermore, a more reliable ground connection can be obtained between a ground plane on the circuit board when the connector is mounted thereon.

Moreover, a further improved assembly process and electrical connection is ensured since the mounting members can be directly soldered to the ground plane by applying surface processing to the conductive material to obtain good solderability therebetween.

The invention will now be described by way of example with reference to the following detailed description of the invention in conjunction with the accompanying drawing in which:

FIGURE 1 is an exploded perspective view showing a shield member and a connector housing; and

FIGURE 2 is a perspective view showing the shield member according to the present invention assembled to the connector housing thereby forming a shielded electrical connector.

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A shield member according to the present invention is formed from a sheet of suitable conductive metal and comprises a shield section 1A covering a front surface of an electrical connector housing as well as mounting members 2 integrally formed therewith. Mounting members 2 are utilized to mount the electrical connector onto a circuit board and are soldered thereto to establish a ground connection therewith. Leg sections 2A extend in rearward direction from shield section 1A with mounting members 2 being folded downward at a right angle from leg sections 2A.

A shroud 6 extends forward to shield section 1A. Shroud 6 may be rectangular in shape and have indents 3 located in upper and lower walls thereof. Shroud 6, in the preferred embodiment, has retaining apertures 3A in the sidewalls thereof for receiving latching members of a complementary connector. Further, at both sides of shield section 1A are located threaded holes 4 for securing the connector to a panel. Leg sections 2A are located underneath threaded holes 4. Lugs or securing members 5 are located at the upper end of and on both sides of shield section 1A in alignment with threaded holes 4 and lugs or securing members 7 are located at the rear ends of leg sections 2A. These lugs 5, 7 are adapted to be folded for engagement with recesses 5A, 7A at the upper and back ends of housing 8.

At the lower right and left sides of housing 8 are located L-shaped slots 8A which respectively receive leg sections 2A and mounting members 2. Slots 9 extend from the front of housing 8 toward the rear along surfaces 8B of housing 8 with slots 9 in communication with respective slots 8A to receive mounting members 2.

When shield member 1 is assembled to housing 8, shield section 1A extends along and engages the front surface of housing 8, and leg sections 2A with mounting

members 2 are inserted in slots 8A, 9 and the front surface of housing 8.

After shield member 1 is placed onto housing 8, lugs 5, 7 are bent into respective recesses 5A, 7A of housing 8 to secure shield member 1 and integral mounting members 2 to housing 8, as shown in Figure 2. Electrical contacts 10 are assembled in housing 8 by a separate process, completing shielded electrical connector 11 as shown in Figure 2.

10 Housing 8 contains holes 8C to accommodate receiving the screws for fixing the connector to a panel through aligned threaded holes 4 of shield section 1A. Thus, the connector can be fixed to a panel by inserting the fixing screws from the front surface of shield member 1.

15 Shielded connector 11 can be mounted onto a circuit board with mounting members 2 being inserted in corresponding apertures in the circuit board and providing an interference fit therein, thereby temporarily maintaining the connector on the board whereby mounting members 2 can

20 then be soldered to the ground path or land on the board. As can be discerned mounting members 2 constitute a pair of spaced legs which act as spring members. The bottom edges of the spaced legs are tapered from inner edges to outer edges to enable the pair of spaced legs to be

25 readily inserted into the board hole. The outer edges are serrated to frictionally engage the sidewalls of the hole along the thickness of the printed circuit board, thereby maintaining the connector on the circuit board.

Since a shield member according to this invention is

30 composed of a shield section 1A and mounting members 2 formed integrally therewith, a more reliable electrical continuity therebetween can be ensured. The shield member with the integral mounting members 2, can be easily secured to housing 8 by bending lugs 5, 7 into engagement

35 with the housing. Therefore, the man-hours required for

assembly of the shield member having integral mounting members onto the connector can be substantially reduced, whereby a very reliable shielded electrical connector is produced which is easily mounted onto a circuit board by the integral mounting members which temporarily secure the connector to a printed circuit board by frictional engagement in apertures therein and more permanently upon being soldered to a ground plane, thus forming an excellent ground connection therewith.

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CLAIMS:

1. A metal shield member for an electrical connector comprising a shield section (1A) for shielding the connector and mounting members (2) for mounting the
5 connector onto a circuit board, characterized in that:

said shield section (1A) includes integral leg sections (2A) having said mounting members (2) extending therefrom, and

securing members (5, 7) are provided by said shield
10 section (1A) for securing the shield member (1) onto a housing (8) of the connector with the mounting members (2) being exposed to engage holes in a circuit board to mount the connector thereon.

2. A metal shield member as claimed in claim 1,
15 characterized in that said mounting members (2) are disposed at a right angle with respect to said leg sections (2A).

3. A metal shield member as claimed in claim 2,
characterized in that said mounting members (2) each
20 comprises a pair of spaced legs having tapered free ends and serrated outer edges.

4. A metal shield member as claimed in claim 1
characterized in that said securing members (5, 7) are lugs.

25 5. A shielded electrical connector for mounting onto a circuit board comprising a dielectric housing (8) having electrical contacts (10) secured therein for electrical connection to conductive areas on the circuit board and a shield member (1) secured onto the housing
30 (8), characterized in that:

said shield member (1) includes a shield section (1A) extending along said housing (8) and having integral leg sections (2A) extending along said housing (8), said leg sections (2A) including integral mounting sections
35 extending outwardly from a bottom surface (8B) of said

housing (8) for engagement with holes in the circuit board to maintain the shielded connector on the circuit board.

6. A shielded electrical connector as claimed in claim 5, characterized in that said housing (8) has slots (8A) along which said leg sections (2A) extend.

7. A shielded electrical connector as claimed in claim 6 characterized in that said slots (8A) include slots (9) in communication therewith through which said mounting members (2) extend.

8. A shielded electrical connector as claimed in claim 5 characterized in that said mounting sections (2) each comprises a pair of spaced legs having tapered free ends and serrated outer edges.

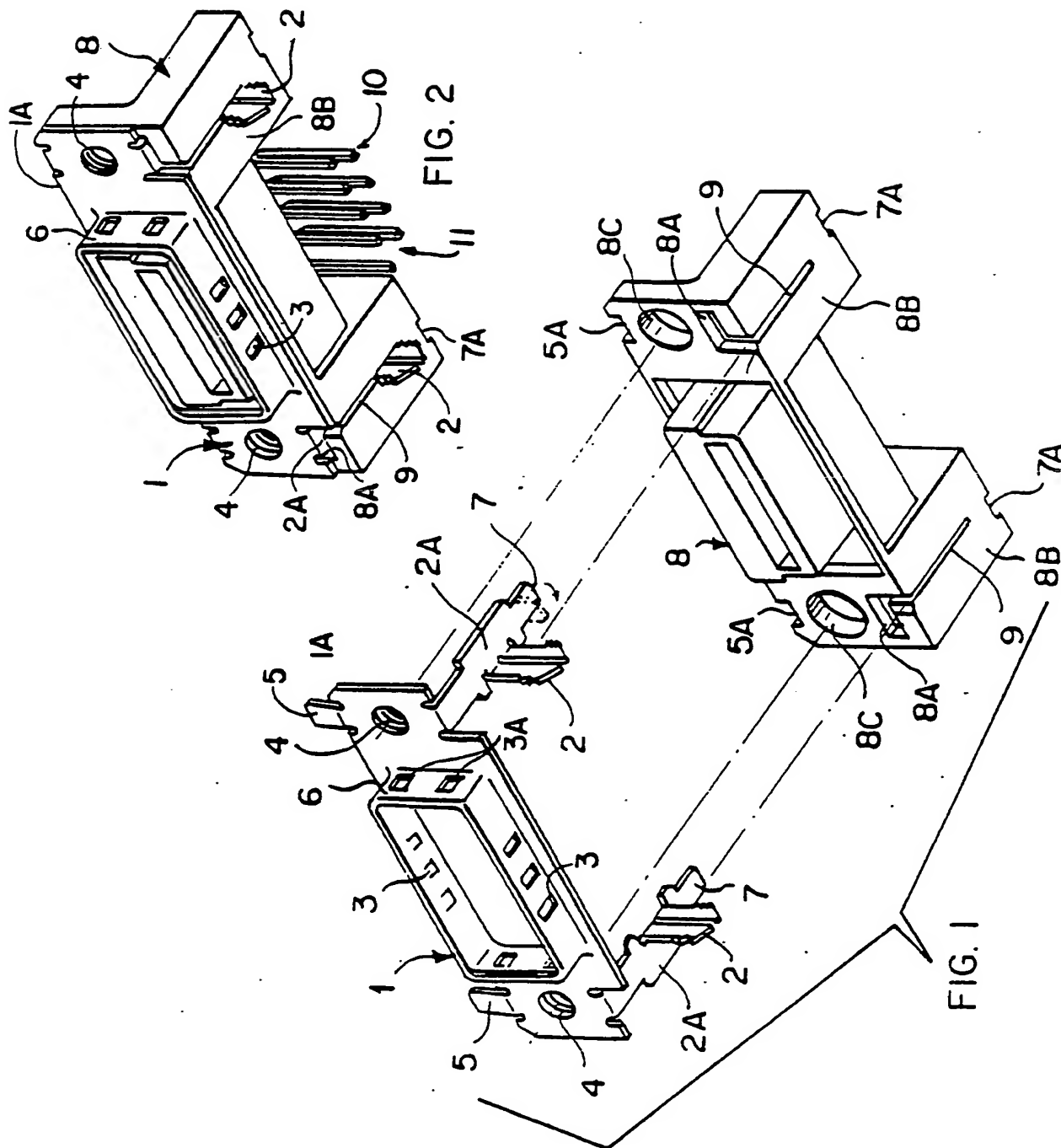
9. A shielded electrical connector as claimed in claim 5, characterized in that said shield member (1) includes lugs (5, 7) disposed in recesses (5A, 7A) of said housing (8) securing said shield member (1) onto said housing (8).

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INTERNATIONAL SEARCH REPORT

International Application No. **PCT/US 88/00940**

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC IPC ⁴ : H 01 R 13/658											
II. FIELDS SEARCHED <div style="text-align: right; font-size: small;">Minimum Documentation Searched ⁷</div> <table style="width: 100%; border: none;"> <tr> <td style="width: 25%; border: none; vertical-align: top;"> <div style="border: 1px solid black; padding: 2px;"> Classification System IPC⁴ </div> </td> <td style="border: none; vertical-align: top;"> <div style="border: 1px solid black; padding: 2px;"> Classification Symbols H 01 R 13/00; H 01 R 23/00 </div> </td> </tr> </table> <div style="text-align: center; font-size: x-small; margin-top: 5px;"> Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸ </div>			<div style="border: 1px solid black; padding: 2px;"> Classification System IPC⁴ </div>	<div style="border: 1px solid black; padding: 2px;"> Classification Symbols H 01 R 13/00; H 01 R 23/00 </div>							
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III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹ <table style="width: 100%; border: none;"> <tr> <th style="width: 10%; border: none; font-size: x-small;">Category ¹⁰</th> <th style="width: 70%; border: none; font-size: x-small;">Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²</th> <th style="width: 20%; border: none; font-size: x-small;">Relevant to Claim No. ¹³</th> </tr> <tr> <td style="border: none; text-align: center; vertical-align: top;">Y</td> <td style="border: none; vertical-align: top;"> EP, A, 0180284 (DU PONT DE NEMOURS) 7 May 1986 see page 4, lines 12-29; figure 1 -- </td> <td style="border: none; text-align: center; vertical-align: top;">1-9</td> </tr> <tr> <td style="border: none; text-align: center; vertical-align: top;">Y</td> <td style="border: none; vertical-align: top;"> US, A, 4512618 (AMP) 23 April 1985 see column 2, lines 7-18; figure 1 ----- </td> <td style="border: none; text-align: center; vertical-align: top;">1-9</td> </tr> </table>			Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	Y	EP, A, 0180284 (DU PONT DE NEMOURS) 7 May 1986 see page 4, lines 12-29; figure 1 --	1-9	Y	US, A, 4512618 (AMP) 23 April 1985 see column 2, lines 7-18; figure 1 -----	1-9
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Y	US, A, 4512618 (AMP) 23 April 1985 see column 2, lines 7-18; figure 1 -----	1-9									
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>											
IV. CERTIFICATION <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> Date of the Actual Completion of the International Search 6th June 1988 </td> <td style="width: 50%; border: none; vertical-align: top;"> Date of Mailing of this International Search Report <div style="text-align: right; font-size: large;">04 JUL 1988</div> </td> </tr> <tr> <td style="border: none; vertical-align: top;"> International Searching Authority <div style="text-align: center;">EUROPEAN PATENT OFFICE</div> </td> <td style="border: none; vertical-align: top;"> Signature of Authorized Officer <div style="text-align: right;"> P.C.G. VAN DER PUTTEN </div> </td> </tr> </table>			Date of the Actual Completion of the International Search 6th June 1988	Date of Mailing of this International Search Report <div style="text-align: right; font-size: large;">04 JUL 1988</div>	International Searching Authority <div style="text-align: center;">EUROPEAN PATENT OFFICE</div>	Signature of Authorized Officer <div style="text-align: right;"> P.C.G. VAN DER PUTTEN </div>					
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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

US 8800940
SA 21718

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on 23/06/88
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A- 0180284	07-05-86	JP-A- 61109268 AU-A- 4912585	27-05-86 08-05-86
US-A- 4512618	23-04-85	US-E- 32502	15-09-87